attention to this class of cases, the pathological classification of which will readily come when they obtain general recognition clinically.

The most important teaching of this paper, to which all should give heed, is that there is no doubt that but little stress can be laid on the mere absence of albumin from the urine in rejecting or confirming a diagnosis of chronic Bright's disease; that in any instance in which an examination for albumin is demanded as a part of an investigation to detect or exclude kidney disease, no decided opinion dare be ventured as to the absence of the latter without further search of the urine, to determine not only the mere presence or absence of morphological kidney elements,* such as casts or epithelium, but also to discover the condition of the secretory renal function. As the latter can only be determined by an examination of a mixed twenty-four hours' specimen of urine, the total daily amount passed must be known. It should, therefore, be a rule, admitting of no deviation, in all cases of suspected Bright's disease in which albumin is undetectable in a single unmixed specimen, to obtain that of the total of one or, better, a consecutive series of twenty-four hours. Then, too, when albumin is absent in a single unmixed specimen, it may sometimes be discovered in that of the total twenty-four hours, when the more delicate tests are intelligently employed.

2620 N. Fifth Street, Philadelphia.

TUBERCULOSIS OF THE NASAL MUCOUS MEMBRANE; WITH A REPORT OF TEN NEW CASES.

By Maximilian Herzog, M.D.,
LARYNGOLOGIST AND OTOLOGIST TO THE GERMAN HOSPITAL, CINCINNATI, OHIO; LATE ASSISTANT TO PRIVAT-DOCENT DR. OTTO SEIFERT'S UNIVERSITY POLYCLINIC FOR THE DISEASES OF THE NOSE, BUCCAL CAVITY, AND THROAT, AT WUERZBURG.

Less than two decades ago tuberculosis of the nasal mucous membrane was a subject almost unknown to medical writers and observers. Men of such extensive experience as B. Fraenkel and Sir Morell Mackenzie confess that they have never seen a case. The former (see[1], bibliography) states that he thinks "tubercular ulcerations in the nose are of the utmost rarity," while the latter[2] admits that he probably has overlooked some cases of tuberculosis of the nasal mucous membrane among those many thousands of cases of laryngeal phthisis which he has seen. During the last ten or fifteen years, however, our knowledge of tuberculosis of the nasal mucous membrane has been extended by a number of contributions, which become more frequent the more our attention is directed to this affection. Richard von Volkmann,[3] the celebrated German surgeon, from his clinical observations and from theoretical deduction, stated that he believed that a number of tubercular affections of the nose are generally overlooked, or rather incorrectly diagnosticated. He points out that certain forms of ozæna believed to be due to congenital lues are most probably of a tubercular nature. Hajeck[4] was the first who succeeded in proving this assertion of Volkmann, by finding tubercle bacilli in the granular masses removed in cases of nasal affections which presented such clinical features that they would—without the bacteriological investigation—have been classified under the head of ozæna. It even looks as if tuberculosis of the nasal mucous membrane is not confined exclusively to the human race, and that we may eventually find it among the monkeys, who, as is well known, are very susceptible to pulmonary tuberculosis. Shurly[5] reports such a case of probable nasal tuberculosis in a monkey.

---

* Nor should these be excluded until a search of sediment, obtained by the use of the centrifugal machine, is made. Notwithstanding it is accepted that the mere presence of hyaline and granular casts, though highly suggestive, is not pathognomonic of an actual coarse kidney lesion, their presence in the urine always indicates at least functional disturbance of the kidney; and when not due to alterations in blood-pressure (congestion and associated albuminuria) and when accompanied by the presence in the urine of renal epithelium, or when associated with symptoms of renal inadequacy and persistently raised blood-pressure, it may be safely asserted that chronic nephritis exists.

If we collect all cases of tuberculosis of the nasal mucous membrane reported in medical literature up to date, the total number, compared with the enormous number of other tubercular affections in other parts and organs of the human body, appears very small. Undoubtedly the nose is an organ which possesses a high degree of immunity against the tubercle bacillus. While the nasal mucous membrane is not endowed with an absolute and universal resisting power against each and every pathogenic micro-organism—we may here only mention how frequently it is attacked in the course of true bacillar and in streptococci diphtheria—it is, on the other hand, by no means immune against Koch's bacillus exclusively. There are very few well-authenticated cases of gonorrhœa of the nasal mucous membrane on record. Ricord has never seen one, and Diday, who has experimentally tried a large number of times to inoculate the nose with gonorrhœal pus, has failed without exception to produce a gonorrhœa of the nose.

Cornet[6] has shown that it is the dried and pulverized sputum of phthisical patients which furnishes the source of infection for tuberculosis of the lungs, by being inhaled into the respiratory tract. The parts which necessarily in normal respiration come in contact first with the tubercle bacilli inhaled are the nasal mucous membranes. Still, tuberculosis of these structures, not only as a primary disease but also as a secondary affection in phthisical subjects who expectorate hourly millions of bacilli, and consequently are constantly exposed to auto-infection, is a rare condition. Hildebrand,[7] by animal experiments, has demonstrated how important a factor the nose is in preventing micro-organisms from penetrating into the lower parts of the respiratory tract. He compelled two rabbits of equal size to breathe, for three-quarters of an hour, air impregnated to a moderate degree with spores of aspergillus fumigatus; one rabbit was allowed to breathe *per vias naturales*, while the other one, whose mouth and nose had been closed up, was compelled to breathe through a canula introduced into a tracheotomy wound previously made. When a post-mortem was held on both rabbits, four days later, it was found that the two upper lobes of the right lung, and one upper lobe of the left lung of the animal on which a tracheotomy had been performed, showed the characteristic hepatization due, as first shown by Lichtheim,[8] to the invasion of the micro-organisms used in this experiment, while both lungs of the rabbit which had been allowed to breathe *per vias naturales*, through the nose, were perfectly free from any pathological changes, and could be inflated perfectly, like any other apparently normal lung.

Hildebrand, from these and other experiments, concludes that the micro-organisms suspended in the air we breathe, do not normally get into the deeper parts of the respiratory tract, but are kept back by the nose and naso-pharynx. It is evident that if these parts have the function of keeping back from the lungs pathogenic micro-organisms suspended in the air, they must necessarily be endowed with such properties as to make innocuous or remove such micro-organisms. Nature, in the phytogenetic development of the upper parts of the respiratory tract in higher animals, could not create an apparatus which should have the function to keep back inimical elements, without also investing it with the power to destroy or get rid in some way of these dangerous, unwelcome guests. Robert Koch,[9] indeed, stated, in one of his first publications concerning the etiology of tuberculosis, that the tubercle bacillus, if it has entered the respiratory tract, is usually removed by its ciliated epithelium. Cornet[10] points out that not only the ciliated epithelium, but also the current of mucus forms a potent physiological safeguard against the inroad of bacilli. The upper parts of the respiratory tract are endowed either with ciliated epithelium or with pavement epithelium in a thick layer; a few spots only of parts more or less in relation with the upper air-passages are devoid of any epithelium whatever, but here we have a strong constant double current of leucocytes—one current toward the interior, one directed outwardly. It is the function of the latter to destroy micro-organisms coming in contact with the parts so protected.[11] These are all, as we see, provisions to pevent foreign obnoxious elements from either entering the deeper parts of the respiratory apparatus, or getting into the substance of the structures forming the upper parts. That this is effectually accomplished, as far as the tubercle bacillus is concerned, is proven by the comparative rareness of tubercular affections of the pharyngeal[12] and nasal mucous membranes.

While, as stated above, tuberculosis of the nasal mucous membrane is a subject which has only received recently the attention it deserves, this pathological lesion has been mentioned centuries ago, already by no less a medical genius than Morgagni,[13] who put a case on record from the post-mortem table, stating that it showed tubercular ulcerations of the upper parts of the pharynx, extending thence to the velum palati, and *from the latter to the nasal mucous membrane.* Bayle[14] must have seen tubercular ulcerations of the nose, because he says: "Qui occupent assez souvent la bouche, le pharynx *et même les fosses nasales des phthisiques* . . . je soupçonne que cette affection tient à la diathèse tuberculeuse."

The first more modern case of tuberculosis of the nasal mucous membrane was recorded by Willigk,[15] who, in his report of 1600 autopsies made at the Prague Pathological Institute from 1850 to 1852, comprising 476 individuals tuberculously infected, found one male with tuberculosis of the septum narium. Further details are not given in this case. The next case of which we read in literature is the more interesting, as it is one of tuberculosis of the upper air-passages (above the larynx) *without any affection of the lungs.* On November 16, 1875, W. Fairlie Clarke[16] exhibited before the meeting of the Pathological Society of London, Eng., a specimen of what he called tubercular lupus of the tongue, palate, and gums, taken from a male patient, eighteen years old, a bricklayer, who died at the West London Hospital, from inanition, the tubercular affection having finally prevented him from taking any food. It is further stated in the post-mortem report that the mucosa of the nose was thickened and ulcerated. The case was diagnosticated *intra vitam* as one of tuberculosis by Sir James Paget. Mention is made in the post-mortem report, that the lungs were entirely free from any pathological changes. The next cases are reported by Laveran,[17] in 1877, and during the next twelve years quite a number of additional reports of cases came forth, so that Mertens,[18] in 1889, in a dissertation made under the direction of Dr. Otto Seifert, Chief of the University Polyclinic for the Diseases of the Nose, Buccal Cavity, and Throat, at Wuerzburg, was able to give a collection of thirty-one cases, in which collection, however, two of the older cases were not included.

Including ten new unpublished cases, a history of which will be given presently in this paper, I am able to now tabulate from literature eighty cases of tuberculosis of the nasal mucous membrane. This number does not include a few more case-reports recently published in medical periodicals and annuals, which are at present not accessible to me, namely, cases published by Hajeck,[19] Maracěk,[20] and Heryng,[21] two cases of which absolutely no details are given, and of which Scheinmann[22] only states that they were greatly benefited by a course of pyoktanin treatment, nor, finally, nine cases by Capart,[23] who says that he has seen twelve cases of nasal tuberculosis, but only gives details of three of them.

The new cases published in this paper came under observation since 1889 (after the publication of Mertens' paper), at the Wuerzburg Polyclinic, except the last one, which was seen by the author after his return from Germany, in his private practice at Cincinnati, Ohio. The following is an abstract of the history of these ten cases:

CASE I.—This case has been reported in literature before; it was one of Mertens' (*loc. cit.*) cases which again came under observation and treatment later on. It well illustrates the chronic course of tuberculosis of the nasal mucous membranes and its tendency to lead to frequent relapses of the pathological process in spite of energetic surgical interference.

E. S., female, born in 1868. States that she has been the subject of some eye trouble in the left eye (dacryocysto-blennorrhœa) for eight years. She now (1886) complains that the left side of her nose is stopped up, so that she cannot breathe through it. The examination of the nasal cavities shows an hypertrophic left lower turbinated covered with granulations which bleed easily. December 31st, the granulating hypertrophies were removed by the cold snare. On February 10, 1887, the operation wound, after several cauterizations with chromic acid, and after a prolonged course of iodol insufflation, had cicatrized. June, 1888, the patient presented herself again with suppurating cervical glands. They were removed and found to be tubercular. Nasal cavities apparently in normal condition. February 4, 1889, the patient again complained about the stopping up of the left side of the nose. The trouble began, as patient states, about eight weeks before. Examination showed that the left lower meatus was completely obstructed by a granulation tumor. This tumor was removed, and a very few tubercle bacilli were found in sections made from it. The patient, after some time, ceased to attend. (So far, the case has been reported already by Mertens.)

January 23, 1890. Patient again makes her appearance at the clinic; she again complains that the left side of her nose is stopped up. Other cervical glands are suppurating. The examination shows granulating masses springing from the left lower turbinate filling up the lower and the middle meatus. A posterior rhinoscopic examination shows thickening of the septum at the posterior nares on both sides. Tongue and mucous membrane of cheeks normal; teeth sound; larynx normal. The tubercular masses in the nose were removed, and the suppurating cervical glands extirpated. The patient soon again disappeared, before the open surfaces in the nose had healed up.

CASE II.—A. V., aged twenty-six years, female, servant-girl. This patient has been under treatment before for lupus faciei, and lupus mucosæ nasi. She now presents a lupus at the inner canthus of the right eye. On the left surface of the septum there is seen a small exostosis, opposite to which there is a small ulceration on the lower turbinated bone. The naso-pharynx is filled with dried-up crusts. Tongue coated, several teeth necrotic, larynx normal.

March 13, 1890. Cauterization of the ulceration with acidum trichloraceticum; aristol insufflation.

15th. Repeated cauterization with acid. trichloracet.; aristol insufflation.

20th. Cicatrization complete; patient dismissed from treatment.

June 30. Patient, who has been for eight days under treatment at the eye clinic, makes her appearance again. On the floor of the right nasal cavity a new ulcer has appeared, likewise on the middle of the right lower turbinated bone on the same spot where formerly an ulcer had been situated. The ulcerations were scraped with the sharp spoon, and the bleeding surface was treated with pure lactic acid.

July 10. Wounds healed up; patient dismissed from treatment.

November 7. Patient makes her appearance again. The right nasal cavity at its floor shows granulations, on the left side the lower turbinated bone shows ulcerations. Old lupus of the ductus naso-lachrymalis on the right side, fresh lupus of this duct on the left side. The treatment consisted in the same measures adopted before; besides, on December 1, 1890, the patient received a tuberculin injection. Typical reaction of the lupoid ulcerations on the face, etc., and on the nasal mucous membrane where the ulcerations were situated. After the third injection of tuberculin all of the ulcerations were healed up, on December 13th; on December 20th there were again new ulcers showing themselves. After eight more tuberculin injections all was again healed up. February 17, 1891, no more reaction after tuberculin injection. February 24th, a small ulceration on the left lower turbinate bone again visible, which was treated with lactic acid. The patient did not make any further attendance.

CASE III.—H. E., aged twelve years, came to clinic again March 17, 1890; he had been previously treated (about one year before) for tuberculosis of the nasal mucous membrane, and an ulcer on the right lower turbinated bone. When the patient came under observation again, on above date, the lymphatic glands of the neck, especially those situated below the inferior maxilla, were all enlarged; lungs normal. The lower free margin of the inferior turbinated bone presented a small ulcer. Naso-pharynx smooth; in the middle of the pharyngeal tonsil a long cleft presented itself. Tongue smooth, papillæ normal; lingual tonsil slightly hypertrophic. Ulcer cauterized with acid. trichloracet.

27th. Repeated cauterization.

April 10. Ulcer healed.

25th. Patient dismissed.

July 1. Patient again came up for treatment. Ulcer on the floor of the right nasal cavity; on the septum cartilaginum and on the right lower turbinate, profuse granulations everywhere in ulcerations. Scraping with sharp spoon; cauterization with lactic acid.

10th. The ulcers have not yet healed; new granulations have appeared. Treatment as before.

25th. Ulcerations healed. Patient instructed to introduce into his right nasal cavity, daily, a tampon saturated with equal quantities of balsam of Peru and glycerin.

March 18, 1891. Patient, who has been feeling perfectly well until about two weeks ago, complains about the formation of crusts in his nose. An examination reveals ulcerations and granular masses at the places where they had been previously observed. Therapy as before.

April 12. New granulations removed.

June 3. New granulations removed.

October 1. Patient had not come to the clinic for a number of weeks. His mother got impatient, and took the boy away from town to the home of Rev. Pfarrer Kneipp, who examined him, pronounced his case one of nasal polypi, and ordered "Zinnkrautthee and Knieguesse." The patient now shows extensive ulcerations, and the septum is perforated. Therapy as before; europhen insufflation.

March 5, 1892. During the last week a shallow ulceration has appeared on the lower margin of the right nasal bone. The sound introduced into this ulceration can be felt from the outside through the external integument. Therapy: Opening of the nasal cavity during chloroform narcosis; scraping with sharp spoon.

18th. Incision wound healed; more granulations removed.

October 25. Several times small granular masses were removed since the last extensive operation. The general condition of the patient has improved materially. He looks well; the cervical glands are normal in size and consistency. The ulcerations in the right nasal cavity are healed; only a few granulations remain on the right lower turbinate. They were removed with the sharp spoon.

CASE IV.—May 5, 1891. A. N., aged twenty-six years; farmer's daughter. Has been treated for three years for tuberculosis of the nose. Patient of medium size, of strong build; submaxillary glands indurated; cicatrices of former glandular suppuration. On the left side of the septum, beginning near the anterior nares and extending to a good distance posteriorly, an ulceration is seen, of an uneven surface, irregular outlines covered with thick granulations. These granular masses at the anterior margin of the ulcer form a small tumor. Another small tumor is seen on the inferior turbinate on the same side, which is of a dark-red color and bleeds easily. Larynx normal. Removal of the tumors by means of the cold snare and cauterization with acid. lactic. pur.

June 2.—Patient shows again an ulcerating surface on the septum. The ulcer cauterized with lactic acid.

6th. Ulcer on the septum almost completely healed. The lower turbinate is free from any ulceration.

Case V.—K. Z., aged thirteen years, female. Patient thin, anæmic; tuberculosis of the ductus naso-lachrymalis on both sides; the ducts are laid open by ulcerations. Lungs do not give any signs of pathological changes. On the floor of the right nasal cavity, near the ostium nasale of the lachrymal duct, opposite the right middle turbinate, a tuberculous shallow ulceration. An ulceration of the same kind on the anterior end of the left lower turbinate. Naso-pharynx and buccal mucous membrane, normal; larynx normal. The ulcerations were cauterized several times with lactic acid. Patient soon disappeared.

Case VI.—September 4, 1890. F. S., pianomaker, aged fifty years, male; had been under treatment before for nasal trouble. In fair general condition of health; dulness over right apex. Nasal mucous membrane on left side reddened but not thickened, dry; on the right side a tumor of the size of a hazel-nut, springing from the middle turbinate, appears. The tumor has a granular surface, is of a grayish-red color, of soft consistence, and bleeds easily. The tumor can also be seen to some extent by posterior rhinoscopy.

18th. The larger part of the tumor removed by the cold snare.

19th. The stump removed by the sharp spoon.

Case VII.—October 9, 1890. R. Q., aged thirty-one years, male, a glass-worker. Large, stout, and healthy; lungs normal. On the left side of the septum, opposite the left inferior turbinate, an easily bleeding ulceration covered with tubercular granulations. They were removed with lactic acid. The patient soon disappeared.

Case VIII.—S. P., aged forty-nine; farmer's wife. Has been suffering from a dacryocysto-blennorrhœa for two years, and from catarrh and stopped-up nose for one year; weakly built female. Ulcerating tubercles, ulcerations, and granulations are seen on the inner side of the right ala of the nose. The tip of the nose also shows tubercles.

May 5, 1892.—The granulations were removed by the sharp spoon. An iodoform tampon introduced.

23d. Repeated scraping with sharp spoon. Emplastrum hydrarg. applied to the tip of the nose.

June 1.—The wounds on the inner side of the ala have become cicatrized. A few new granulations around the perforation in the cartilaginous septum. Granulations are also now seen on the floor of the nasal cavity and on the lower turbinate. They were all removed by the sharp spoon.

28th. The nodules on the tip of the nose have disappeared; the skin over it is perfectly smooth. New granulations on the floor of the nasal cavity and on the lower turbinate. Removal by sharp spoon.

October 19. Tip of nose normal in appearance, also ala and anterior nares. Mucous membrane of interior shows smooth cicatricial tissue; perforation shows smooth margins.

Case IX.—June 6, 1892. C. P., aged twenty-one years, male. No complaint about nose; healthy-looking; lungs normal. One sister died of pulmonary tuberculosis. No swelling of cervical or any other lymphatic glands. On the middle of the lower turbinate bone of left side a roundish tumor of the size of a hazel-nut, grayish-red in color, easily bleeding on being touched with a nasal sound. Larynx normal. Tumor removed. Patient did not return.

. . . .

A few of these histories may, perhaps, appear to the critical reader somewhat short—too meagre to make on their showing a diagnosis of tuberculosis of the nasal mucous membrane. It may also elicit some doubt whether it is really correct that in a town of the size of Wuerzburg, within a few years, such a comparatively large number of cases of tuberculosis of the nose should have come under observation. It may be stated, however, that in Wuerzburg, as well as in the surrounding smaller places dependent for medical aid upon the hospitals and clinics of the former, tubercular affections are unusually common; this part of Germany seems to be completely impregnated with the tubercular virus. In fact, I have never been in any medical centre in the hospitals and clinics of which tubercular affections are so overwhelmingly prominent in number as in Wuerzburg. As far as the histories (copied from the clinic record-book) of some of the above cases are concerned, it must also be said that, after the first cases came under observation, tuberculosis of the nasal mucous membrane in Wuerzburg lost the dignity of a great rarity, consequently no very extensive entries were made in the clinic journals, though every case was examined carefully by Dr. Seifert and his assistants; particles of diseased tissue removed were examined microscopically, and when they did not give unmistakable evidence of the tubercular character of the process, the iodide of potassium treatment was tried, to establish or exclude the diagnosis of syphilis.

In one particular case, in which a number of circumstances combined to suggest the diagnosis of tuberculosis, the anti-luetic treatment compelled to a change of diagnosis. As this was a very instructive case its history may here be given:

M. S., female, aged twenty-one years, servant, had been suffering from a very obstinate conjunctivitis on both eyes. She was treated at the University Eye-clinic, and when she developed some nasal trouble she was turned over to the clinic of Dr. Seifert, with the diagnosis: *tubercular conjunctivitis.* A rhinoscopic examination revealed granular masses on both lower turbinates looking very much like tubercular nasal granulomes. Influenced by the external appearance of the neoplasms, the diagnosis of tuberculosis of the nasal mucous membrane was made, and the growths were removed. A microscopic examination, and later clinical observations, caused some doubt as to the correctness of the diagnosis of tuberculosis; an anti-luetic treatment was instituted, and under it the case was rapidly cleared up as one of syphilis of the nose.

CASE X.—March 30, 1893, Cincinnati. C. G. B., aged thirty-three years, male, clerk; married for ten years; has no children; father died forty-three years old, of consumption; mother died of congestion of the bowels. About two years ago patient had a violent attack of coughing, with hemorrhage from lungs. Thinks, however, that he has not lost in weight during the last two years. No night-sweats, but coughs a good deal, especially in morning; denies infection, and no objective signs of it; uses alcohol and tobacco in moderate form. Has been hoarse for two months. Lungs: On left side below and above scapula behind, and below and above clavicle in front, dulness on percussion; bronchial breathing. Mucous membrane of pharynx injected and granular. Larynx mucous membrane injected; enlarged vessels; swollen; infiltration of false vocal cord on left side; true vocal cord on left side, margin ulcerated.

31st. Sputum examined; tubercle bacilli found in large number.

April 6 to 18. Patient has been ordered to take his temperature three times a day; it ranges between 99° and 101°. Temperature during the twelve days hardly ever normal.

3d. Patient, who had been ordered to take creasote, tr. gent. āā beginning with gtt. v and increasing by one drop every day up to gtt. xxx, stated that he had had since yesterday several copious hemorrhages from the nose. Examination revealed an oval, shallow, bleeding ulceration on the right side of septum near the floor, beginning almost directly behind the tip of the nose and extending backward, about 1 cm. long and 5 mm. wide Near the posterior pole of the oval ulceration the anterior end of a crista is covered with small grayish tubercles and granules. They bleed easily on being touched with the nasal sound. The surface of the ulceration and the tubercles on the anterior end of the crista are treated energetically with the galvano-cautery burner; europhen is then insufflated, and the nasal cavity tamponed. During the next eight days the ulcerations bleed freely several times. They were not cauterized again, but sprayed freely with a solution of peroxide of hydrogen, and europhen then insufflated. This always acted as an astringent, and evidently also antiseptically, for gradually, as the patient (who can stand large doses of creasote remarkably well) under the general treatment improved in general health, the ulceration healed up.

May 15. The patient has gained six pounds in weight. The ulcers of the left vocal cord have improved under a 20 per cent. menthol (in ol. olivæ) and iodolum insufflation treatment, though not yet healed up. But the ulceration in the nose has completely healed up; its site is always covered with some crusts; on their removal the mucous membrane appears somewhat paler than that of the surrounding parts, but otherwise almost normal.

Undoubtedly the nasal ulceration and the granular nodules observed in this case were of a tubercular nature; they were characteristic in appearance, and occurred in a patient in the advanced stages of tubercular and laryngeal phthisis. The good result as to the treatment of these lesions in the nose (even if it be only a temporary one) I am inclined to attribute to the combination of the external surgical interference combined with the internal use of creasote, which evidently has acted very well, the patient having gained six pounds in weight under its use in about six weeks.

These, then, are the ten cases now first reported. I will now proceed to give a list of all cases published, and try to obtain from it a general clinical picture of the affection under discussion.

If we look over our collection of cases—eighty in number—we will find that tuberculosis of the nasal mucous membrane presents itself (a classification first proposed by Seifert) in three different forms: as an ulceration, as a tumor, and as a combination of both—either an ulceration, the margins of which present granular masses, or as a tumor which has been eaten away more or less by a process of ulceration. In our table we find seven cases in which no details are given as to the form of the tubercular lesion; the remaining seventy-three may be classified as follows:

Thirty-six cases in which the ulceration was predominant.

Twenty-nine cases in which the lesion had the character of a tumor.

Eight cases in which the lesion had a mixed character.

STATISTICAL TABLE OF EIGHTY CASES OF TUBERCULOSIS OF THE NASAL MUCOUS MEMBRANE REPORTED IN MEDICAL LITERATURE.

No.	Reported by whom, and where	Sex.	Age.	Form of lesion, location, etc.	Primary or secondary, and remarks.
1	Morgagni: De sedibus et causis morborum.	...	...	Tubercular ulcerations of pharynx, velum palati and nasal mucous membrane.	
2	Willigk: Prager Vierteljahrschrift, xxxviii. p. 4.	...	...	Tuberculosis of septum.	
3	Clarke: Trans. Path. Soc. Lond., 1876, vol. xxvii p. 248.	M.	18	Mucous membrane of nose ulcerated and thickened.	Secondary to tuberculosis of tongue, palate, gums; lungs free. Patient died of inanition.
4	Laveran: Union Médicale 1877, Nos. 35 and 36.	M.	25	Ulceration on septum.	Tuberculosis of lungs. Patient died of pyo-pneumothorax
5	Laveran: Ibid.	M.	43	Ulceration on septum.	Tuberculosis of lung. Patient died of phthisis.
6	Riedel; Deutsche Zeitschrift für Chirurgie, Band x. p. 57.	M.	63	Ulceration and perforation of cartilaginous septum; tumor in same 2½ cm. long; ulceration on left ala.	Primary; no evidence of pulmonary tuberculosis; reappearance of tumor and ulceration growths after surgical treatment.
7	Riedel: Ibid.	F.	55	Ulceration and perforation on cartilaginous septum, also tumor 1½ cm. long.	Primary; no evidence of tuberculosis of lungs.
8	Spillmann: Bernier's Thèse de Spillmann, p. 190.	F.	33	Ulceration on left side of septum.	Phthisis, hæmoptysis, ulceration on anus.
9	Thornwald: Deutsche Archiv für klin. Mediz. Bd. xxvii. p. 586.	M.	26	Tumor on anterior end of left lower turbinate size of pea; on the floor of nasal cavity of same side tumors of same size; ulceration on septum.	Tuberculosis of pharynx, larynx and lungs
10	Wichselbaum: Allgem. Wiener med. Zeitung.	M.	15	Small nodules and tumors of size of hempseed on septum and floor of nasal cavities.	No further details given.
11	Wichselbaum: Ibid.	F.	62	Small tumors on right lower turbinate and on left middle turbinate.	No further details given.
12	Riehl: Wiener mediz. Woch., 1881, No. 45.	M.	36	Ulcer on left ala and on left side of septum.	Tuberculosis of lungs; died of phthisis.
13	Millard: Bull. Soc. Méd. des Hôp., 1881.	...	...	Tubercular nodules in nasal cavities.	Tuberculosis of pharynx. Post-mortem report no further details given.
14	Demme: Berl. klin. Woch., 1883, p. 218.	M.	1	Ulcer and small nodules on septum.	Tuberculosis of lungs; child died (1½ y'rs old) of phthisis.
15	Demme: Ibid.	M.	8 mos.	Nodules and ulcer in nasal cavities.	Primary when first seen. The child died soon after it came under observation of an acute attack of tubercular meningitis Post-mortem showed lungs and bronchial glands free from tuberculosis.
16	Berthold: Berl. klin. Woch., 1884, p. 644.	...	...	Tuberculosis of nasal mucous membrane.	No further details given.
17	Sokolowiski: Beitr. Chirurgie v. Bruns. Band iii. fasc. 3, p. 438.	F.	20	Ulcer on septum and floor of nasal cavity; tumor on anterior margin of ulceration.	Tuberculosis of lungs and larynx; death in consequence of these.
18	Schaefer: Deutsche med. Woch., 1887, No. 16.	F.	51	Granular tumor of septum cartilagineum	Primary; removal of tumor, reappearance later; perforation of septum.
19	Schaefer: Ibid.	F.	26	Granular tumor of septum cartilagineum.	Primary; removal, reappearance.
20	Schaefer: Ibid.	F.	39	Granular tumor of septum cartilagineum.	Primary; removal, reappearance, ulceration, perforation.
21	Schaefer: Ibid.	M.	32	Granular tumor of septum cartilagineum.	Primary; several times reappearance after removal.
22	Schaefer: Ibid.	M.	57	Granular tumor of septum cartilagineum.	Primary; tumor appeared after a kick (by a horse) in nose; after removal, no reappearance after nine months.
23	Schaefer: Ibid.	M.	51	Granular tumor of septum cartilagineum.	Primary; removal, reappearance
24	Cartaz: De la Tubercul. Nasale, Paris, 1887.	M.	42	Ulcer on septum cartilagineum.	Tuberculosis of lungs; died of phthisis.

No.	Reported by whom, and where.	Sex.	Age.	Form of lesion, location, etc.	Primary or secondary, and remarks.
25	Bruns: Reported by Zuneshaburo Kikuzi in Bruns' Beitr. z. Chir., Bd. iii. fasc. 3, p. 433.	M.	30	Tumor of septum ulcerated on its surface.	Primary; no tuberculosis in other organs; removal, reappearance after five months.
26	Michelsohn: Zeitschr. f. klin. Mediz., 1890, Bd. xvii.	F.	27	Tumor of septum cartilagineum.	Primary; no tuberculosis in other organs. Patient a demented, neglected girl. Removal, reappearance, later ulcerations.
27	Michelsohn: Ibid.	F.	21	Ulceration of septum cartilagineum.	Tuberculosis of larynx and lungs; died of phthisis
28	Michelsohn: Ibid.	F.	48	Tumor of septum cartilagineum.	Primary; no tuberculosis of other organs.
29	Michelsohn: Ibid.	F.	19	Tumor on left lower turbinate.	Tuberculosis of larynx and lungs.
30	Michelsohn: Ibid.	M.	18	Ulcer on septum cartilagineum and ala.	Tuberculosis of upper lip, of submental and submaxillary glands; lungs free.
31	Juffinger: Wien. klin. Woch., 1889, ii. 253.	F.	21	Tumor of septum.	Lupus of cheek and neck; removal, reappearance.
32	Hajeck: Inter klin. Rundschau., 1889, iii. 613.	M.	30	Ulcer on septum.	Tumor in naso-pharynx; tuberculosis of lungs; removal; ulcerations.
33	Hajeck: Ibid.	M.	13	Ulcer; destruction of septum osseum.	Tuberculosis of glands.
34	Hajeck: Ibid.	F.	24	Ulcer on septum cartilagineum et osseum.	Patient otherwise healthy.
35	Mertens: Dissertatio Inauguralis. Wuerzburg, 1889.	F.	53	Ulceration on right lower turbinate and on left side of septum cartilagineum.	Primary; no tuberculosis of other organs; cauterization of ulcers; frequent new ulcerations appear on site of old ones.
36	Beermann: Dissertatio Inauguralis. Wuerzburg, 1890.	F.	34	Small tuberculous tumors on right side of septum cartilagineum.	Primary; no tuberculosis of other organs; removal, reappearance after 3 months.
37	Hahn: Deut. medizin. Woch., 1890, N. 13, p 497.	F.	22	Several small tumors on septum cartilagineum and right lower turbinate.	Primary; no tuberculosis of other organs; removal; after six months tumor had not reappeared.
38	Hahn: Ibid.	M.	40	Tumor size of walnut which had perforated septum and protruded into other side.	Lupus of hand and face had been existing for many years.
39	Hahn: Ibid.	F.	55	Tumor size of hazelnut; perforated septum cartilagineum.	Primary: no tuberculosis of other organs; removal; tumor had not reappeared after three months.
40	Hahn: Ibid.	F.	17	Two small tumors on septum cartilagineum.	Chronic eczema of face; no tuberculosis of other organs.
41	Hahn: Ibid.	F.	19	Ulcer with granular masses on right side of septum cartilagneum.	Blepharitis ulcerosa; keratitis superficialis; scrofulus habitus; eczema of upper lip.
42	Hahn: Ibid.	F.	17	Ulcer with granular masses on septum.	Left apex dulness on percussion.
43	Knapp: Arch. f. Ophth. 1890, vol. xix.	M.	19	Ulcer in nose several years before; a tubercular conjunctivitis came under observation	No tuberculosis of other organs mentioned.
44	Fitzpatrick: Cin. Lancet-Clinic, 1891, p. 468.	M.	25	Tubercular ulcer on mucous membrane.	Tuberculosis of pharynx and lungs; died of phthisis.
45	Fick, Correspond.-blatt. f. Schweiz. Aerzte, 1891, p. 211.	F.	26	Tuberculosis of left side of septum.	Tuberculosis of nasal duct both apices suspicious.
46	Haab: Ibid.	M.	...	Tuberculosis of nasal mucous membrane.	Tuberculosis of conjunctiva
47	Gottstein: Die Krankheiten de Kehlkopfes, 1890, p. 272	...	...	Tubercular deposit on septum narium, and perforation.	Tuberculosis of lungs, otitis media phthisica.
48	Grunwald: Die Lehre von den Nasen Eiterungen. Munich, 1892, p. 48.	...	...	Tuberculosis of nasal mucous membrane left lower turbinate.	Empyema of the antrum of Highmore.
49	Grunwald: Ibid.	...	...	Tuberculosis of nasal mucous membrane, right lower turbinate ulcerated.	Empyema of the antrum of Highmore.
50	McBride: Diseases of the Throat, etc. Philadelphia, 1892.	...	...	Tubercular nasal ulceration of lower and anterior part of septum; margins thickened.	No further details given.

No.	Reported by whom, and where.	Sex.	Age.	Form of lesion, location, etc.	Primary or secondary, and remarks.
51	Jurasz: Die Krankheiten der obern Luftwege. Heidelberg, 1891, p. 2. (The first of Jurasz's three cases has also been previously reported by Boylan, Cincinnati Lancet-Clinic, 1888, vol. xiv. p. 1.)	F.	19	Flat tumor on right side septum cartilagineum. uneven and ulcerated on surface.	Tuberculosis of skin of left thumb and right cheek was the primary tubercular affection; lungs at time when patient was seen first normal. One year later patient died of galloping phthisis.
52	Jurasz: Ibid.	M.	36	Irregular, ragged-edged ulcer on left side of septum.	Tuberculosis of lungs, caries of ribs, tuberculosis of buccal mucous membrane
53	Jurasz: Ibid.	M.	44	Ulcer in a thickened mucous membrane on right side of septum.	Phthisis pulmonalis et laryngis, also tubercular ulcer on tongue.
54	Olympites: Thèse de Paris, 1890.	M.	36	Ulcer on septum cartilagineum covered with small granulations.	Pulmonary and laryngeal tuberculosis.
55	Luc: Arch de Laryngol 1889, Tome iii. p. 19.	M.	...	Granular tumor of the right lower turbinate ulcerated on its surface, later ulceration on left middle turbinate.	Tuberculosis of pharynx: tubercular orchitis; lungs very slightly suspicious.
56	Moure: Thèse de Paris de Boutard, 1889.	..	...	Tubercular ulceration in nose.	Tuberculosis of lungs, larynx, and pharynx.
57	Moure: Ibid.	M.	29	Ulcer on right side of septum cartilagineum, with granular surface.	Tuberculosis of lungs and larynx.
58	Ruault: Ibid.	M.	35	Oval ulcer on right side of septum cartilagineum near entrance to nose.	In last stages of tuberculosis of lungs.
59	Ruault: Ibid.	F.	40	Tumor springing from right side of septum cartilagineum.	Tubercular infiltration of larynx; fifteen months later tubercular infiltration of left apex. After removal of tumor septum soon became perforated. Death three months after pulmonary infiltration was first noticed.
60	Ruault: Ibid.	E.	23	Tumor on left side of septum cartilagineum	Primary; examination of lungs negative. This case was under observation two years; tumor removed four times; came back three times Five months after last removal no reappearance. Patient's condition of general health very good
61	Capart: Bull. de l'Acad. Roy. de Med. de Belg., 1890, Tome vi. p. 785.	F.	25	Easily bleeding soft tumor on the right side of septum cartilagineum.	Lungs free. The tumor was first, in 1884, believed to be a sarcoma. It was, therefore, extirpated very carefully, and did not reappear. Later the author corrected his diagnosis to tuberculosis of nasal mucous membrane.
62	Capart: Ibid.	F.	53	Easily bleeding soft tumor on the right side of septum cartilagineum.	Probably of secondary nature. Patient died soon of miliary tuberculosis
63	Capart: Ibid.	M.	35	Large tumor on septum cartilagineum.	No details as to primary or secondary nature given. Author states, after citing Cases 62 and 63, that he has seen in all 12 cases of tuberculosis of nasal mucous membrane; patients aged between 21 and 55 years; 7 males and 5 females.
64	Grossard: Anales de la Polyclinique Paris-Bordeaux.	M.	...	Tubercular ulcer on septum cartilagineum.	Tubercular bronchitis; patient was also syphilitic.
65	Vincenzo Cozollino: Gaz. Medic. di Roma, Anno 1889, xv. p. 145.	F.	young girl	Tubercular ulcer on septum cartilagineum, with perforation.	Tuberculosis of lungs; died of phthisis
66	Cozollino: Ibid.	M.	...	Tubercular ulcer on septum cartilagineum, with perforation.	No further details.
67	Baber: Brit. Med. Journ. 1889, No. 22, vol. vi. p. 1407.	F.	18	Perforation of septum cartilagineum.	Strumous disease of upper air-passages, tubercular eruption on outside of nose.

No.	Reported by whom, and where.	Sex.	Age.	Form of lesion, location, etc.	Primary or secondary, and remarks.
68	Tenneson: Anales de Dermatologie et Syph., 1889, vol. iii. p. 214.	...	...	Tubercular ulceration in nasal cavities.	Consolidation of right apex.
69	Onodi: Pest. med.-Chir. Presse, 1891, No. 46.	...	...	Tuberculosis of nasal mucous membrane.	
70	Browne: Sajous' Annual 1888, vol. iii. p. 261.	F.	20	Tuberculosis of nasal mucous membrane.	Tuberculosis of pharynx and larynx.
71	Own Case, No. I. (This case was once before reported by Mertens: Dissert. Inaug. Wuerzburg, 1889. It came again under observation later on, and was therefore left out of the table above.)	F.	24	Nasal tuberculosis first complained of in 1886; granular masses on left lower turbinate; later large granular tumor.	Eye trouble (dacryocysto-blenorrhœa since 1878) suppurating cervical glands.
72	Case II....................	F.	26	Ulceration on floor of nose, right side, and on left lower turbinate.	Lupus of face and also formerly lupus of mucous membrane of nose; lupus of inner canthus of right eye.
73	Case III....................	M.	12	Ulceration on right lower turbinate floor and septum cartilagineum; later perforation.	Enlargement of cervical glands; lungs free. After long treatment finally good result. General health good.
74	Case IV....................	F.	26	Ulceration of septum cartilagineum, covered with thick granulations, also tumor.	Strumous habitus; vestiges of glandular suppuration.
75	Case V....................	F.	13	Ulcerations on floor and on left turbinate bone.	Lupus of ductus naso-lachrymalis on both sides; lungs free.
76	Case VI....................	M.	50	Granular tumor of size of hazelnut springing from right middle turbinate.	Dulness over right apex.
77	Case VII....................	M.	31	Ulceration on left side of septum cartilagineum, with granular masses.	Lungs normal.
78	Case VIII....................	F.	49	Ulcerations and granulations on right ala; later perforation of septum.	Dacryocysto-blenorrhœa for two years; tip of nose shows granulations.
79	Case IX....................	M.	21	On middle of lower turbinate a granular easily bleeding tumor.	Lungs and larynx normal; everything else normal.
80	Case X....................	M.	33	Tubercular ulcer right side of septum cartilagineum, with small tubercles.	Tuberculosis of lungs and larynx; hæmoptysis.

Of course, one must not suppose that this classification is an absolute one. Very frequently we find an ulceration with some small granular masses either on its margins or its surfaces; if the ulceration is so pronounced that compared with it the neoplastic formation is insignificant, we have classified such a case as one of the ulcerative variety. On the other hand, we rarely see a tumor which is absolutely intact and without any ulceration whatsoever. However, if we see a case in its earliest stages we may find a perfectly intact tumor. Such was the case in my own patient No. IX. This case was only discovered accidentally; there were no complaints on the part of the patient, who was, to all intents and purposes, a healthy young laborer, in whom, outside of this tumor, no pathological condition could be discovered. The tumor was removed, and a microscopic examination verified the diagnosis made previously from the clinical aspect of the case. If we study closely our cases tabulated, we are perhaps able to gain some points as to the question why tuberculosis of the nasal mucous membrane presents itself in one case in the form of a tumor, and in another in the form of an ulceration. In all probability we find a tumor in cases where we have to deal with the immigration of a comparatively small number of tubercle bacilli only, while in those cases where a large number of bacilli assault the tissues from the start, we will find the ulceration. The toxic effects of a large number of bacilli, which, of course, produce larger quantities of ptomaines, is so powerful that the formation of a neoplasm of any size is impossible. I use the term neoplasm unhesitatingly for tubercular nasal tumors. The fact that they may disintegrate later on in their existence is certainly not opposed to our views, because neoplasms of other kind take the same course. It is almost impossible to understand how a laryngologist of merit and distinction can deny the existence of tubercular tumors in the nose, and maintain that if such tumors are found they are originally not of a tubercular nature, but are only secondarily so infected. Bresgen,[24] who claims this, stands, as far as I can see, alone in his views, which are the less justifiable, first from the fact that in tubercular tumors we do not find the bacilli on or near the surface (Hajeck, *loc. cit.*); secondly, from the fact that we have in other situations and organs of the body tubercular processes leading to the formation of large and granular masses. We find in the larynx, as everybody knows, frequently extensive infiltrations, which only later on disintegrate and ulcerate. I have myself on one occasion seen such a powerful, rapidly growing neoplastic formation in one of the false vocal cords of a young woman aged about thirty years, that one of the greatest authorities in laryngology made the diagnosis "sarcoma of the larynx," which diagnosis, later on, had to be corrected to "tuberculosis," bacilli and giant cells having been found in an extirpated piece of the tumor.

Our view that the number of bacilli will influence the form of the tubercular lesion in the nose, is borne out by the fact that where we have to deal with a tuberculosis of the nasal mucous membrane secondary to phthisis—that is, under conditions when the individual permanently produces and expectorates enormous numbers of bacilli, and is exposed to them, where, consequently, when it comes to an invasion into the nose, most probably large numbers of bacilli locate there from the start—there we find almost universally, as seen from our table, the ulcerative form. On the other hand, where we have to deal with a primary tuberculosis of the nose, we almost exclusively find the lesion in the form of the tumor. This brings us to the question of *primary tuberculosis of the nasal mucous membrane.* That such a thing is possible has been denied; however, this denial is not borne out by the facts. Our table probably contains twenty cases of primary nasal tuberculosis.

Even if we admit that in some of these twenty cases doubts may arise as to their primary nature, we have cases enough left to prove that such a thing as primary nasal tuberculosis does occur. The case given in our table under No. 3, while it is probably not a case of primary tuberculosis of the nasal mucous membrane, but one of primary tuberculosis of the pharynx or tongue, is a clear post-mortem report, showing that tuberculosis of the upper air-passages without phthisis does occur. If we read the histories of some of Schaeffer's (*loc. cit.*) cases (Table, Nos. 19–24) we shall find that it would be almost impossible to make of them anything else but primary cases.

An especially interesting and instructive case is Demme's second case (Table, No. 15). The little patient, a boy eight months old, from healthy stock, was given out when six months old to board with a family, the head of which was the subject of an advanced pulmonary tuberculosis. After being in charge of this man for two months, the child was brought to Demme for treatment, suffering from a nasal affection presenting the general features of an ozæna. There was no trace of a history of tuberculosis or syphilis in the parents of the child. A close rhinoscopic examination revealed grayish tubercles and ulcerations in the nose of the infant. The secretion taken from these lesions contained tubercle bacilli. A few days after coming under observation the boy became the subject of a very violent meningitis, rapidly leading to a fatal issue. The post-mortem revealed a tubercular basilar meningitis; while the lungs, bronchial glands, and abdominal organs, were absolutely free.

This case certainly must be looked upon as one in which the nasal tuberculosis was the primary affection. From the nose, the habitat of the tubercle bacilli, the latter found their way into the meninges, a convenient road over which not so unfrequently, even after insignificant operations in the nose, another micro-organism, the diplococcus of Fraenkel, travels to produce another meningeal affection, cerebro-spinal meningitis. Another case, which can hardly be construed as anything else but a primary one, is one of Ruault's cases (Table, No. 60). The patient, a healthy young woman of twenty-three years, was under observation two years; she never showed any signs or symptoms of anything else but her nasal trouble, which finally, after a fourth removal of the tumor, did not reappear. The patient's general condition while under observation was always good.

One of Michelsohn's cases (Table, No. 26), that of a demented, very much neglected girl of twenty-seven years, who was under observation for a long time, is also an undoubted primary case. We can well imagine how in it the infection was brought about. Demented individuals are very unclean; they do not pay any attention either to hygiene, cleanliness, or æsthetics. So this girl was probably in the habit of boring frequently with dirty fingers in her nose, and finally succeeded in importing bacilli into its mucous membrane. Probably, in the same manner, the nasal tuberculosis was brought about in one of Jurasz's cases (Table, No. 51).

The patient was suffering from a tubercular ulceration of the integument of the left thumb; this latter case, of course, is to be considered one of secondary nasal tuberculosis.

Some of our own cases might be enumerated here, but it is hardly necessary to dwell any more upon the subject; the possibility and occurrence of primary nasal tuberculosis cannot be doubted.

The *secondary* form of nasal tuberculosis is usually due to phthisis, be it that the bacilli which the phthisical patients expectorate are inhaled into the nose, or be it that they are carried to the nose through the blood and lymph channels. The latter seems to me very improbable.

In our table we find twenty-five cases in which tuberculosis of the lungs and larynx is mentioned as the primary affection. Ten times we find tuberculosis of the pharynx, palate, and tongue mentioned in connection with nasal tuberculosis; the latter form is usually secondary to the former. The *seat* of the tuberculosis of the nose is of interest. Often we find that more than one of the structures of the nasal cavities are involved. Fifty-three times we find the septum mentioned as the seat of the lesion; almost universally it is the septum cartilagineum which is involved; this part is either expressly mentioned, or the seat of the lesion, with reference to the entrance of the nose, is so described that one can easily see that the seat must be in the cartilaginous part of the septum. Only twice we find the septum osseum the site of the tubercular lesion: two of Hajeck's cases (Table, Nos. 33 and 34). Not infrequently the tubercular lesion situated on the septum leads to perforation, but as the osseous part is so rarely involved, saddle-noses in consequence of nasal tuberculosis almost never occur. Other parts of the nasal mucous membrane affected are: the lower turbinate (eleven times), the middle turbinate (three times), the inner side of the alæ (four times), the floor of the nose (five times). No details as to the seat of the lesion are given in ten cases. From the above figures we see that the septum cartilagineum is by far the most favored site of tubercular lesions of the nasal mucous membrane; it evidently constitutes in the nose a locus minoris resistentiæ for Koch's bacillus. As to sex, nasal tuberculosis in contradistinction to laryngeal tuberculosis does not seem to have any preference. Our table shows—

	Cases.
Males	35
Females	34
Sex not stated	11
Total	80

If we divide our material according to age we get the following figures:

	Cases.
1 year or under	1
1 year to 10 years	1
11 years to 20 years	16
21 " 30 "	19
31 " 40 "	13
41 " 50 "	6
51 " 60 "	7
61 " 70 "	2
Age not given	15
Total	80

The youngest patient, as shown by our tables, was eight months, the oldest sixty-three years old. The majority of all eighty cases occur between the ages of eleven and forty (forty-eight times). Nasal tuberculosis under one year and beyond sixty years, is very rare.

Tubercular tumors of the nasal mucous membrane are very variable in size; we find them from a millet-seed size to a large walnut size. The largest tumor in size is put upon record by Hahn (Table, No. 38); it occurred in a laborer, forty years old, who first came to the clinic in 1886. The patient presented a lupus of the hand, stating that he had had this affection since his twelfth year, a lupus of the tip of the nose since his seventeenth year, a chronic nasal catarrh since his ninetenth year. In the left inferior meatus there was seen an easily bleeding granular tumor of the size of a large walnut. The tumor had perforated the septum, and protruded into the right nasal cavity. After its removal the microscopic examination of sections of the growth revealed the characteristic structure of nasal tuberculomes, including the presence of tubercle bacilli. This case is not only of interest because it presents the largest tumor on record, but also because it shows the close relation between tuberculosis of the nasal mucous membrane and lupus of the external integument, a subject to be mentioned more fully below.

Tubercular nasal tumors are of roundish or elliptical general outlines; their surface is rarely perfectly smooth; as a rule it is uneven; granular, covered with tubercles; presenting, on the whole, somewhat of a strawberry appearance as to outline, but not as to color, because a grayish or grayish-yellow tint is predominant over the red or pink of the healthy normal nasal mucous membrane. The consistence of these granulation tumors is rather soft; they bleed very easily on being touched with the sound.

Sometimes we find instead of one well-defined tumor a number of small tubercular nodules. These generally disintegrate very soon, and when they are seen, not unfrequently after a short time the picture presented is that of an ulceration, nothing having been left of the neoplastic formation. The ulcerations found in nasal tuberculosis are generally shallow, but sometimes also deeper ulcerations are seen; they are roundish, elliptical, or perfectly irregular in outline, surrounded by elevated soft margins, showing miliary tubercles. These ulcerations always bleed more or less; sometimes they may give rise to quite profuse hemorrhage. In our own case (No. X.) this occurred; the bleeding was quite free, a larger bloodvessel probably having been laid open by the ulcerative process. Sometimes large granular masses, more or less soft, and easily bleeding on being touched by the sound, spring from one or more points of the circumference of the margins of the ulcer.

The *microscopical examination* of tumors and granular masses removed from the margins of an ulceration, show a granular tissue traversed by connective-tissue bands. The cellular elements very much predominate, and consist of lymphoid and epithelioid cells. Frequently we see an aggregation of the cellular elements in masses, which present themselves in section in circular or oval outlines. Sometimes these cellular aggregations show nothing but a dense mass of cells, but sometimes the character of the genuine tubercle becomes evident, and giant cells, show themselves. Tubercle bacilli, if found, are few and far between. One often has to examine several sections of one and the same specimen before being able to detect tubercle bacilli. According to Hajeck (*loc. cit.*), they are easier found and in greater number in the deepest layers of the tumors. Bloodvessels are not so numerous in tubercular neoplasms of the nose, as, for instance, in sarcomatous growths. But they are more numerous than in syphilitic neoplasms. Around a bloodvessel, in a nasal tuberculome, we often find an aggregation of the cellular elements; sometimes cells have proliferated through the vessel wall into the lumen of the vessel; but we never see, as in syphilis, an extensive cellular proliferation comprising the whole circumference, and thickening enormously the middle coat of the vessel.

The *symptoms* of our disease vary a good deal according to the form under which it presents itself. Not infrequently, in the earlier stages, we do not find any symptoms at all. The patients have perhaps had a little running from the nose, sometimes a few drops of blood mixed with the discharge, but have not been inconvenienced to any extent, and have not paid any special attention to their trouble. Sometimes we have to deal with a tumor which has not yet attained a large size, and has absolutely not given rise to any symptoms whatever (our case No. IX.).

At other times, however, the tumor has become of such a size that the patient comes with the statement that his nose is stopped up. If we have to deal with the ulcerative variety the complaints will be profuse discharge, mixed with blood of a general muco-purulent character, yellowish or greenish in color, and often fetid. The formation of crusts is generally complained of by patients the subject of tuberculosis of the nose. Pain is rarely a symptom, and externally the nose seldom presents any anomalies, lest it be that we either have a complication with lupus or tuberculosis of the external nasal integument, or that we meet with one of these very rare cases, when the tubercular process has destroyed the septum osseum, and consequently has given rise to a "saddle-nose." If after taking notice of the subjective symptoms a case presents, we next proceed to an objective examination, we will get a different picture, according to the variety we have to deal with, but, as a rule, in each case we find the attacked side of the nose filled with greenish-yellowish crusts; not infrequently a certain amount of fetor emanates from the nasal cavities. After the crusts are removed we will be able to see whether we have to deal with a case of tumor of the nose, ulceration, or one of a mixed character. In making a *differential diagnosis* of tuberculosis of the nasal mucous membrane, all the points as to clinical features, appearance of the lesion, etc., brought out above, have to be considered. It is sometimes not at all easy to make a correct diagnosis of each case when first seen. But the combination with tuberculosis of other organs, which is the rule (primary and uncomplicated cases being greatly in the minority), will greatly help toward a correct diagnosis. A microscopic examination will generally make a diagnosis absolutely certain. With carcinomatous growth, tubercular neoplasms of the nose could hardly ever be confounded; sarcomatous tumors of the small-celled variety may possibly mislead, but they are richer in bloodvessels than tuberculomes, and, of course, do not show any giant cells or bacilli. Clinically, a case of a sarcomatous tumor of the nose will likewise soon distinguish itself from tuberculosis. These tumors grow rapidly, are very soft, smooth on their surface, vividly red to purple, even to almost black, in color. After partial extirpation, sarcomatous tumors do not, like tuberculomes, re-form comparatively slowly, but, on the contrary, with surprising rapidity. Carcinoma in the nose may be mistaken for tuberculosis, and *vice versa*, but the former disintegrates more rapidly, and the disintegration involves deeply the structures on which the cancer grows; the margins of the ulceration are not like those in tuberculosis, soft, but on the contrary, very hard. Besides, carcinoma leads soon to that characteristic hard infiltration of the neighboring lymphatic glands, while tuberculosis eventually leads to, or is secondary to, suppuration of the cervical lymphatic glands. Malignant cachexia also shows itself early in carcinoma, while tuberculosis of the nose, if not combined with tuberculosis of some vital internal organs, may last for years without very seriously involving the patient's general health. The most important differential diagnosis is that from syphilis of the nose, a very frequent affection which often can only be differentiated from tuberculosis with difficulty. Some of the best writers on tuberculosis of the nasal mucous membrane have made it a very important point of differential diagnosis that tuberculosis attacks the septum cartilagineum, while syphilis attacks the septum osseum, and avoids the former.

This point is brought out on the strength of a statement coming from a celebrated rhinologist, Voltolini,[25] who maintains that syphilis assaults the septum osseum eagerly, but shows as decided a dislike for the cartilaginous part of the septum. I cannot verify this statement of Voltolini by my own observations; they, on the contrary, indicate a quite different state of affairs. Others have also had experiences quite different from those of Voltolini, for instance Jurasz,[26] who reports fifty-five cases of syphilis of the nose in which forty-five times the septum was the seat of the luetic lesion. In thirty-one out of these forty-five cases a perforation developed in the course of the affection; thirty times this perforation was found in the septum cartilagineum, and only once in the septum osseum. I think that such statistics, coming from a perfectly reliable source, show that the seat of the lesion or perforation cannot be utilized as a point of differential diagnosis between syphilis and tuberculosis of the nose. We should always, whenever we suspect a case of nasal tuberculosis, try to exclude syphilis. Usually, this will not be difficult, because we generally will find other undoubted syphilitic lesions, or vestiges of such. In very small children suspected cases are almost always due to congenital lues, because nasal tuberculosis, as we have seen, under one year is of the utmost rarity, there being in all literature only one case on record, while early nasal syphilitic manifestations are by no means rare.

Michelsohn[27] believes that a valuable point of differential diagnosis is to be found in the observation that tubercular ulcers of the nose are of a roundish or irregular form, while luetic ulcerations extend in the form of a longitudinal furrow far backward. A microscopical examination may, in case we find giant cells or tubercle bacilli, make a diagnosis absolute, but the absence of them does not necessarily mean syphilis. Some other microscopical differences between tubercular and syphilitic tumors have been alluded to above. After all, we will meet cases where the diagnosis between tuberculosis and lues must be left in suspense—until we have come to a final conclusion, through the free administration of the iodides, which will definitely decide the case, *ex juvantibus et nocentibus.*

In some cases we shall not be able to distinguish tuberculosis of the nasal mucous membrane from lupus of the same structure. In the light of our present knowledge upon the etiology of tuberculosis and lupus, we cannot be astonished that such may be the case. We know now, beyond a doubt, that tuberculosis and lupus are due to the same etiological factor, and we must expect transitory forms, which will be called by one name by one observer and by another by some other writer. A good deal has been written upon a microscopic differential diagnosis between lupus and tuberculosis. I do not intend to go into any details upon this subject, as I believe a differential diagnosis between lupus or tuberculosis of the nasal mucous membrane can only be made by the clinical aspect of the case, and not by a microscopical examination; this view seems to me the more correct, as among our eighty cases tabulated we find some in which, beyond doubt, a lupus of the face has spread to the nasal mucous membrane by continuity, and has there taken on the clinical characters and the form of a typical case of tuberculosis. A case of this kind is reported, for instance, by Hahn (*loc. cit.*, Table, No. 38). The patient, when seventeen years old, was the subject of a lupus of the tip of the nose, which yielded to treatment after four years; two years later he began to suffer from a chronic nasal catarrh, and later on he developed a tuberculosis in the form of an enormous nasal tumor. Now, if it be true, as some dematologists, for instance Neisser,[28] Bloch,[29] and others claim, that lupus of the face, as a rule, if not always, is caused by a previous lupus of a mucous membrane, we may have had in Hahn's case first a lupus of the mucous membrane of the nose, later a lupus of the external integument of the nose, which in its turn finally gave rise to a nasal tuberculosis. If such changes are possible, and everything points to the fact that they do occur, it is hard to conceive how exact microscopical border-lines could be drawn. Our own case No. II., presents a combination of lupus faciei and tuberculosis nasi, somewhat like that of Hahn.

The *course* of tuberculosis of the nose, as a rule, is very protracted, provided it does not occur during the last stages of pulmonary tuberculosis, when the phthisis, of course, leads to rapid fatal termination. Cases, however, not complicated with phthisis, may last for many years. In Riedel's case (Table, No. 6) the patient stated that he had been suffering from ulcerations of the nose for twenty-seven years. Some of our own cases (Nos. I., II., III., IV., etc.) were of a very protracted course, and had been under observation and treatment for years. However, even primary tuberculosis may lead to a very quick fatal termination, as shown by Demme's case (Table, No. 15), of a boy eight months old, who died inside of a few days from a tubercular meningitis, consequent and doubtless dependent upon the nasal tuberculosis. As a rule, however, the *prognosis*, as far as life is concerned, is good; tuberculosis of the nasal mucous membrane is in itself not dangerous to life. Possibly it may also eventually lead to a miliary tuberculosis; a case reported by Capart (Table, No. 62) indicates such a possibility. As far as a complete and permanent *restitutio ad integrem* is concerned the prognosis is decidedly bad, because most cases lead again and again to relapses.

The *treatment*, if it shall have any chance to bring about a permanent recovery, must be a radical one. Superficial cauterization, or the insufflation of antiseptic powders, is of no avail. The new growths must be removed as thoroughly as possible; then a permanent result may be looked for with some degree of probability. We see, for instance, that one of Capart's cases was permanently cured. The tumor in this instance was believed to be of a sarcomatous nature, consequently a very radical and extensive operation was made, and the result was good. In our case No. III., the frequent occurrence of relapses was only checked by opening up the nose, dividing it during chloroform narcosis from the outside, and scraping it out with the sharp spoon.

Ulcerating surfaces ought to be either scraped or cauterized energetically with chromic acid, trichloracetic acid, etc., or the galvano cautery; and to the wounds, during and after treatment, antiseptics, such as iodoform, iodol, aristol, or europhen, should be frequently applied. I think it would be an excellent plan to give, during such a course of external treatment, creasote in large doses internally, as I succeeded even in an advanced case of phthisis in bringing about a perfect healing of tubercular ulcerations in the nose. How long this good local result in this case (No. X.) will last I am, of course, unable to state.

The *complications* which we meet in nasal tuberculosis are, as already in part stated above, pulmonary and laryngeal phthisis (mentioned twenty-five times in our table); tuberculosis of the pharynx, palate, and tongue (ten times); lupus of the face and nose, tuberculosis of the skin, chronic eczema of the face (twelve times); tubercular meningitis and miliary tuberculosis (each once); empyema of the antrum of Highmore (twice); suppurating and enlarged tuberculous cervical glands. A very important complication to which I want to refer, with some details upon which no writer on the subject of tuberculosis of the nasal mucous membrane has as yet laid stress, is, that with obstinate cases of dacryocystoblennorrhœa, with tuberculosis and lupus of the excretory duct of the lachrymal apparatus and the conjunctiva, in a combination of nasal with conjunctival tuberculosis, the former may be the primary or the secondary factor. A very interesting case, investigated very fully, is that reported by Knapp (Table, No. 43), a tuberculosis of the conjunctiva of the left eye, in a male nineteen years old. The tubercular nature of the lesion was proven microscopically and by animal experiments. Knapp found in his patient cicatrices of former ulcers in the nose, which had been treated surgically. He believes that these former ulcerations were of a tubercular nature, and says: "In our case it is possible that the infectious material was transmitted from the meatus of the nose through the lachrymal canal into the conjunctival sac. This way of propagation is probable by the development of tubercular ulcers around both puncta lachrymalia." Fick (Table, No. 45) reported a case of tuberculosis of the nasal duct of the left eye, and, on examination, it was found that the nasal septum on its left side presented tubercular ulcerations. Haab (*loc. cit.*, Table, No. 46), in the discussion which followed the report of Fick's case, stated to the Zurich Medical Society that he had presented to it two years previously a case of tuberculosis of the conjunctiva complicated with nasal tuberculosis. (I am unable to find a detailed report of this case.)

In both of the two last cases, as well as in Knapp's case, the nasal tuberculosis was looked upon as the primary affection. In one of Hahn's cases (Table, No. 41) blepharitis ulcerosa is mentioned as one of the complications of this class of nasal tuberculosis. There is hardly any doubt that this ulcerative blepharitis was one of tubercular nature, as the patient is described as being of a general scrofulous habitus. It is not stated whether the nasal or the conjunctival lesion was looked upon as the primary trouble. In our own cases we find a dacryocysto-blennorrhœa in No. I., on the left eye, which had preceded the nasal tuberculosis of the same side for eight years.

A lupus of the inner canthus of the right eye, lupus of both naso-lachrymal ducts, and tubercular lesions in both nasal cavities are found in case No. II.; tuberculosis of the naso-lachrymal ducts of both sides, and nasal tuberculosis, are found in case No. V.; a dacryocysto-blennorrhœa of an obstinate nature, and of two years' standing, is found in case No. VIII.

There can be no doubt, of course, as to the intimate connection of nasal tuberculosis with conjunctival tuberculosis or tubercular disease of the naso-lachrymal duct. Whether the supervention of an obstinate dacryocysto-blennorrhœa in cases of nasal tuberculosis is only a coincidence, a predisposing factor, or whether these suppurative processes were caused by a tubercular invasion, and stand to the nasal tuberculosis in a direct relation, is a question which must be left open at present. It is certainly of great practical as well as scientific import to find a respectable number of our tabulated cases of nasal tuberculosis complicated with tuberculosis of the naso-lachrymal duct or the conjunctiva.

If we now try to formulate the results of our investigation upon the subject of tuberculosis of the nasal mucous membrane, we come to the following conclusions:

1. Tuberculosis of the nasal mucous membrane, compared with tuberculosis of other parts of the respiratory tract, preferably with this affection of the lungs and larynx, is a rare disease; it is, however, not as rare as formerly supposed.
2. It is generally a secondary affection, but also occurs primarily, as proven by unmistakable clinical evidence and by post-mortem facts.
3. Where it occurs it is frequently secondary to pulmonary and laryngeal phthisis.
4. It occurs in the form of ulcerations, tumors, and a combination of both. The tumor is generally found in primary cases, while the ulceration is the prominent factor in advanced cases of phthisis.
5. It may occur at any age (except, probably, in the very earliest months of life), preferably at the ages between ten and forty years.
6. It does not show any predilection as to sex.
7. Its seat is preferably the septum cartilagineum.
8. Its course is very chronic, and relapses even after surgical interference are the rule.

9. It is, *per se*, not dangerous to life, but may eventually lead to fatal complications, such as basilar meningitis, and possibly miliary tuberculosis.

10. One of its most important direct complications by continuity, is that with tuberculosis of the naso-lachrymal duct and the conjunctiva.

11. It may also be complicated with tuberculosis of the pharynx, palate, tongue, external integument; lupus of the nose, face; tuberculosis of the cervical glands, empyema of the antrum of Highmore, etc.

12. Lupus of the face, or of the nasal mucous membrane, may in its further development lead to tuberculosis of the nasal mucous membrane.

Before closing this paper, it is my agreeable duty to most heartily thank my honored teacher and former chief, Privat-docent Dr. Otto Seifert, at Wuerzburg, to whom I am indebted not only for the permission to make use of, and to publish entries from the record-books of his polyclinic, but who also granted me the privilege of taking across the Atlantic his microscopical specimens of some of the above new cases. This has enabled me to give a full description of the microscopic pathological anatomy of nasal tubercular tumors.

BIBLIOGRAPHY.

1. *B. Fraenkel:* Ziemssen's Handbuch d. spec. Path. u. Therapie, 1879, vol. iv. p. 163.
2. *M. Mackenzie:* The Diseases of the Throat and Nose.
3. *Volkmann:* Sammlung klin. Vorträge, No. 168.
4. *Hajeck:* Intern. klin. Rundschau, 1889, p. 13.
5. *Shurly:* New York Medical Journal, November 7, 1891.
6. *Cornet:* Centralbl. f. klin. Mediz., 1888, No. 25. Zeitschr. f. Hygiene, Bd. v. p. 191. Berl. klin. Wochenschr., 1889, Nos. 12–14.
7. *Hildebrand:* Experimentelle Unters. über das Eindringen pathogener Micro-organismen von den Luftwegen und der Lunge. Beitr. z. Path. Anatomie, etc., Bd. ii. p. 421.
8. *Lichtheim:* Ueber pathogene Mucorineen. Zeitschr. f. klin. Mediz., Bd vii. p. 172.
9. *Koch:* Die Aetiologie der Tuberculose. Mittheilungen aus dem Kaiserl. Gesundheitsamte, 1884, vol. ii. p. 90.
10. *Cornet:* Loc. cit.
11. *Stoehr:* Virchow's Arch., Bd. xcvii. p. 211; and *Gulland:* Edinb. Med. Journ., Nov. 1891.
12. *Herzog:* Cincinnati Lancet-Clinic, May 21, 1892, p. 682.
13. *Morgagni:* De sedibus et causis morborum, epist. xix. § 50, et epist. xxviii. § 12.
14. *Bayle:* Recherches sur la Phthisie pulmonaire. Paris, 1810, p. 614.
15. *Willigk:* Prager Vierteljahrsschrift, vol. xxxviii. p. 4.
16. *Clarke:* Trans. of the Royal Pathological Society of London, 1876, vol. xxvii. p. 248.
17. *Laveran:* Union Médicale, 1877, Nos. 35 et 36.
18. *Mertens:* Dissert. Inaug. Wuerzburg, 1889.
19. *Hajeck:* Tubercul. d. Nasenschlht. Intern. klin. Rundschau, 1892, No. 40.
20. *Maracek:* Tubercul. Polypen der Nasenhöhle. Berichte der k. k. Krankenanstalt Rudolphstiftung in Wien (1890) 1891, p. 236.
21. *Heryng:* Tubercul. of the Nasal Mucous Membrane. Medycyna Warszawa, 1892, xx. pp. 525, 605, 625, 640, 691, 708.
22. *Scheinmann:* Berl. klin. Wochenschr., 1890, No. 33.
23. *Capart:* Bulletin de l'Académie Royale de Belgique, 1890, tome vi. p. 785.
24. *Bresgen:* Deutsche mediz. Wochenschr., 1887, No. 20, 22, 27.
25. *Voltolini:* Die Krankheiten der Nase. Breslau, 1888.
26. *Jurasz:* Loc. cit.
27. *Michelsohn:* Ueber Nasensyphilis. Volkmann's Sammlung, 1888, p. 2985.
28. *Neisser:* Ziemssen's Handb. d. spec. Path. u. Ther., vol. xiv. p. 603.
29. *Bloch:* Klin. Beitr. z. Path. u. Therap. d. Lupus vulgaris. Viertelj. f. Dermat. u. Syph., 1888.